CALIFORNIA URBAN WATER AGENCIES

RECOMMENDATIONS TO THE STATE WATER RESOURCES CONTROL BOARD FOR A COORDINATED ESTUARINE PROTECTION PROGRAM FOR THE SAN FRANCISCO BAY-SACRAMENTO AND SAN JOAQUIN RIVER DELTA ESTUARY

August 25, 1994

2. Mitigation credits bank.

It is likely that many parties will be interested in either buying or selling mitigation credits. As was seen during the drought emergency water bank, under appropriate circumstances many water users are willing to sell water not presently needed for consumptive purposes. A central bank with authority to purchase water would facilitate the mitigation credits program. Those in need of credits would pay money to the bank with the security that their payment would represent satisfaction of all or a portion of their responsibility and that the money in fact would be used appropriately. Sellers would be assured of a competitive price for their water or other resources.

A mitigation credits bank would hold "credits" in the form of rights or permits to use water -- to transfer water, to divert water, to operate facilities. The bank would provide a source of funds for environmentally beneficial projects and could possibly act as a promoter of such projects. These credits could be purchased in several ways:

a. By providing an alternative water supply for the Bay-Delta and/or instream uses;

b. By providing funding to purchase an alternative water supply;

c. By providing funding or taking direct action which would have measurable beneficial impacts on the Bay-Delta ecosystem and its resources.

The bank could make exchanges of credits based on "a" and "b", subject to parameters established by the State Board, generally without consultation with resource agencies. For exchanges involving not-like-kind actions under "c", consultation with all appropriate resource and regulatory agencies would be required, as would approval by the State Board or the appropriately designated agency. In addition, exchanges which involved not-like-kind actions would have to be evaluated to ensure that they did not significantly and adversely affect the water rights or water quality of other users or violate any applicable water quality standards.

Banking for credits is used in other environmental mitigation programs such as the emissions trading or "RECLAIM" program in Southern California. The bank could be created through state legislation to ensure that the money paid would go entirely to the purchase of mitigation credits. Alternatively, a separate non-state entity could be the vehicle to handle these transactions. This "private" entity would negotiate water purchases on behalf of the mitigation credits program, subject to State Board approval. Money would likely be deposited in an escrow account to provide security for the transaction.

The advantage of the mitigation credits bank is that it provides access to all who may be interested in purchasing or selling mitigation credits. It centralizes transactions and

provides uniformity to the mitigation credits program. The State Board should provide guidelines to the bank for the prioritization of purchasing of credits in the event that the demand for credits exceeds supply. The bank operators should be required to report routinely to the State Board and must be subject to direction from the State Board to ensure that the program is managed and operated consistently with state policy.

3. Direct exchange.

A mitigation credits bank is not the only means for addressing the use of mitigation credits. Moreover, it would be unwise to limit the market for the creation and purchase of mitigation credits solely to a mitigation credits bank.

The ability to negotiate private transactions for the purchase of mitigation credits would provide benefits in addition to those from the bank. Private transactions would reduce pressure on the mitigation credits bank. Private arrangements would also allow parties that do not wish to sell to the bank to still make their own arrangements among parties of their own choosing. These private transactions would still have to be approved by the State Board to determine equivalency.

The private creation of mitigation credits would also foster more innovation by bringing free market forces to bear. It might also allow for trading among parties, including exchanges of diversion rights, pollutant discharges, and water usage. In addition, other regulatory actions beyond the Bay-Delta hearings might have a bearing on the utility of mitigation credits. This may encourage parties to seek creative ways to address common problems. Finally, if the mitigation credits program is institutionalized, it could have great utility in addressing more localized water issues through an approved and regulated program.

4. Relation to comprehensive plan.

Once a Comprehensive Ecosystem Management Plan has been completed, the mitigation credits program should allow the exchange of non-like-kind actions. For example, it may be possible to determine the fishery benefits due to the forbearance of diverting. If a similar benefit may be computed by a water release, it should be possible to exchange the right to divert for the purchase of water.

H. Mitigation fund.

As discussed above, it will be necessary to establish a fund for the purchase of water supplies above the "reduction cap" set by the State Board. If sufficient funds in excess of those required to purchase water for purposes of meeting the standards are available, this fund also could go toward meeting the state's share of costs for projects mandated under the CVPIA and to finance other non-outflow related environmental improvements. These projects would include rehabilitation and construction of fish screens, replenishment of spawning

gravel, installation of temperature-control devices, and other mitigation and monitoring projects identified by fishery agencies and other fishery experts.

The State Board should ensure the coordination of the administration of this fund with the CVPIA's Restoration Fund and should establish an advisory committee comprised of representatives from the urban, agricultural, and environmental communities to develop recommendations for managing the fund. The recommendations of the committee would be advisory in nature, but the State Board would give substantial weight to the committee's recommendations.

There would be several options for financing this fund. The approach of the CVPIA's Restoration Fund (which is similar to the approach in D-1630) imposes a per-acre-foot fee on water users. A program to generate the revenues to support the mitigation fund could come from this type of surcharge. Any surcharge must not discriminate among water users, however. Water users should receive credit in the state fund for payments made to the CVPIA's Restoration Fund, as it would be unjust for those users to have to pay twice.

II. COMPREHENSIVE MONITORING PROGRAM

There currently are numerous monitoring programs for the Bay-Delta, including the Interagency Ecological Program ("IEP"), the San Francisco Estuary Regional Monitoring Program (and a similar monitoring program being undertaken by the Central Valley Regional Water Quality Control Board), and other agency and utility programs. The IEP has provided a long-term baseline of data, primarily focused on the effects of CVP and SWP operations on the aquatic resources of the Bay-Delta. CUWA recognizes the value of these programs; however, as recommended by the San Francisco Estuary CCMP and Regional Monitoring Strategy, CUWA believes they need to be better refined and coordinated, as well as further enhanced to ensure more effective development and analysis of data.

Progress towards protecting the Bay-Delta depends on understanding the estuary and how its resources are affected by human and natural influences. The long-term protection and recovery of the Bay-Delta ecosystem will require adequate data to resolve scientific uncertainty and determine the relative effects of water project exports, in-delta and upstream diversions, toxic discharges, fishing, exotic species, and, to the extent feasible, predation and competition. It also will be necessary to quantify and document the positive impacts of actions to promote recovery, such as the proposed water quality standards, diversion screening, control of toxics, regulation of pesticide and herbicide discharges, and habitat restoration.

CUWA therefore urges the State Board to utilize its authority under section 13163 of the Water Code to achieve coordination of existing programs and to include provisions for enhanced monitoring of the biological effects of any standards it promulgates, including a management strategy and a funding mechanism for the enhanced program. CUWA further urges the State Board to encourage other agencies to coordinate in the development of a rigorous and comprehensive monitoring and research program that would meet the following needs:

(1) Determine the range of significant biological responses to water quality standards and other management requirements included in State Board regulations, as well as in future ESA regulatory actions.

(2) Identify the factors responsible for the responses and quantify their relationship to changes in biological response, including factors related to land use, diversions, and other variables upstream of the central Delta.

(3) Permit adjustment or correction of existing data and biological and hydrologic models, so that long-term data bases can provide a more accurate picture of trends in abundance and distribution of fish.

(4) Assist managers in addressing important management questions.

Pursuant to Water Code section 13163, the State Board should seek to accomplish these purposes by including specific direction in a draft water quality control plan for the coordination of monitoring activities by (1) the San Francisco Estuarine Institute's RMP and similar programs in the Central Valley, (2) the agencies implementing the Central Valley Project Improvement Act, (3) the IEP, (4) the USFWS and NMFS, and (5) independent programs such as the San Joaquin Valley Endangered Species Recovery Program. Any enhancements to existing programs should be fully integrated to ensure the most effective use of existing and supplemental funding.

III. ANALYSIS OF ECONOMIC IMPACTS

In the notice for its July 13, 1994, workshop, the State Board requested input on the analysis of economic impacts arising from proposed standards and other estuarine protection requirements. CUWA agrees that consideration of economic impacts is important in this context. Among other things, the Porter-Cologne Act explicitly directs the State Board to take economic impacts into account when adopting water quality objectives in water quality control plans. See Water Code section 13241(c).

CUWA recommends that the State Board include the following in its analysis of economic impacts:

First, the State Board should define "without standards" conditions to determine the availability of water before new standards are put in place. The time period for that analysis should focus on both short-term and long-term impacts. In assessing water supply and demand, the State Board should focus on full historic hydrology and pre-existing restrictions. In addition, the State Board should focus explicitly on facilities assumed to be available to mitigate the effect of requirements.

Second, the State Board's analysis should reflect a range of implementation options that reflect the range of possible economic impacts which may result from standards. This should include an analysis of economic impacts on all water supply agencies that might be affected. The State Board should also identify any increased shortages which result from the requirements, and evaluate the costs of those shortages. Finally, the State Board should review the economic benefits available from an active water market.

Third, the State Board's economic analysis should consider the costs of water supply uncertainty. The proposed regulations may make the urban water supply less reliable. This increased uncertainty has cost implications for water supply agencies as well California businesses generally, and those costs should be recognized.

Finally, the State Board should institute a process which includes interested parties in the development of the economic impact estimates. The economic analysis outlined above is complex, and relies on details of water supply agency costs, options and strategies. It will be difficult and time-consuming for the State Board to collect and evaluate these data without assistance from the agencies concerned. CUWA remains willing to cooperate with the State Board staff in conducting this analysis.

A more detailed discussion of the rationale underlying CUWA's recommendations on consideration of economic impacts is attached in Appendix 2.

CONCLUSION

CUWA recognizes that much work remains to be done to put into place an effective program for protecting the Bay-Delta and the important resource values it provides. CUWA hopes that these Recommendations will be viewed as a useful starting point for this process; however, it understands that additional input will be needed from a variety of other constituencies. In considering that input, the State Board should bear in mind several of the key points that CUWA has sought to emphasize in its Recommendations:

First, the State Board must act promptly in setting appropriate estuarine protection standards for the Bay-Delta. Standards are needed now to establish a baseline against which further actions by the State Board and other agencies will be measured.

Second, in giving priority to standards, the State Board must recognize that standards alone are not enough. Standards can only work effectively if they are part of an overall estuarine protection program, each element of which is essential to the ultimate success of the whole.

Third, in setting standards, the State Board must acknowledge that its actions will be based on limited scientific and technical information. Continued work to develop better and more complete information is needed and may result in the modification of standards as additional information becomes available.

Fourth, in implementing standards, the State Board must be prepared to use its full legal authority under both the Porter-Cologne Act and Division 2 of the Water Code. Implementation will require hard decisions affecting the water rights of a variety of interests around the State. The State Board should strive to accommodate those interests in a rational and practical way through, among other things, the phasing-in of program requirements over time.

Fifth, in proceeding generally with an estuarine protection program, the State Board should remember that its actions are part of a broader effort to effectively manage the resources of the Bay-Delta ecosystem. All parties engaged in this effort must work together to ensure that the problems facing the estuary are addressed in a balanced and comprehensive fashion.

Applying these principles to the development of regulatory strategies will go a long way toward the achievement of the State Board's ultimate goal: restoring and maintaining the health of the Bay-Delta, while minimizing the water supply and economic impacts of regulatory actions. CUWA appreciates the opportunity to contribute to the State Board's efforts to develop those strategies. It plans to continue ongoing work to provide useful information and recommendations on estuarine protection and feedback on recommendations offered by others. CUWA is optimistic that, with the cooperation of all parties having interests in the Bay-Delta, the State Board can lead the way in preserving this vital natural resource.

APPENDIX 1

ESTUARINE HABITAT STANDARD[1]

* * * *

[PROPOSED]

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. __ - __

ADOPTION OF WATER QUALITY STANDARDS FOR THE PROTECTION OF ESTUARINE HABITAT IN THE SAN FRANCISCO BAY-SACRAMENTO AND SAN JOAQUIN DELTA ESTUARY ("BAY-DELTA")

WHEREAS:

1. The State Water Resources Control Board ("State Board") may adopt water quality control plans for waters for which water quality standards are required by the federal Clean Water Act in accordance with California Water Code section 13170.

2. The State Board has authority to adopt water quality standards in accordance with section 303(c)(1) of the Clean Water Act and to adopt procedures and methods to control conditions that may affect water quality (including without limitation salt water intrusion resulting from the reduction of freshwater flows from any cause), in accordance with section 208 of the Clean Water Act.

3. The State Board has adopted Resolution No. 91-34, dated May 1, 1991, by which it approved a water quality control plan for salinity in the Bay-Delta that included water quality standards and other requirements to protect various beneficial uses of the estuary ("1991 Bay-Delta Water Quality Control Plan").

4. The State Board has determined to revise and amend the 1991 Bay-Delta Water Quality Control Plan by the adoption of a standard to protect estuarine habitat in the Bay-Delta as measured by the attainment of numerical criteria based on levels of salinity and water quantity flows within the estuary.

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1 Standards are proposed as a preliminary draft resolution for possible adoption by the State Board in accordance with administrative practices and procedures under the California Porter-Cologne Water Quality Control Act ("Porter-Cologne Act"), Cal. Water Code sections 13000 et seq. The draft resolution is not intended as a complete statement of all findings that may be required under the California Administrative Procedures Act ("CAPA"), the California Environmental Quality Act ("CEQA"), or other applicable provisions of state law.

5. In adopting an estuarine habitat standard for the Bay-Delta, the State Board recognizes that maintaining and restoring water quality and habitat conditions in the estuary is a function of different factors that include, but are not limited to salinity and flow. The State Board further recognizes that the implementation of actions to address other factors or other new monitoring information may require future modification of standards consistent with applicable federal law and existing state policy for water quality control, including State Board Resolution No. 68-16 (Statement of Policy With Respect to Maintaining High Quality of Waters in California) and 40 C.F.R. Section 131.12.

6. It is the intent of the State Board to review and, as appropriate, modify adopted standards for the Bay-Delta in connection with its required review of water quality standards pursuant to section 303(c)(1) of the Clean Water Act or as the State Board otherwise deems appropriate.

THEREFORE, BE IT RESOLVED, that:

1. The following water quality standard is applicable to waters specified in the 1991 Bay-Delta Water Quality Control Plan:

   (a) The quality of waters in the Bay-Delta shall be maintained consistent with that level necessary to protect estuarine habitat, fish migration, cold freshwater habitat, and other existing beneficial uses. Protection of estuarine habitat shall be based upon attainment of the following criteria from February 1 through June 1 of each year:

      1. Confluence of Sacramento and San Joaquin Rivers: Maximum daily average electrical conductivity of 2.64 millisiemens per centimeter (ms/cm)[2] , OR maximum 14-day average electrical conductivity of 2.64 ms/cm, OR minimum daily Delta outflow index of 7,100 cubic feet per second (cfs), for the number of days during each of the calendar months February through June, determined from the Sacramento-San Joaquin Unimpaired Flow Index for the previous month using Table 1 (attached). If this standard is met for a greater number of days than the requirement for any month, the excess days shall be applied to meeting the requirement for the following month.

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2 For the purpose of these standards, electrical conductivity of 2.64 ms/cm at the specified measuring stations is equivalent to a salinity of 2 parts per thousand (practical salinity units) at mid-channel, near the bottom of the adjacent waterway.

2. Chipps Island: Maximum daily average electrical conductivity of 2.64 ms/cm, OR maximum 14-day average electrical conductivity of 2.64 ms/cm, OR minimum daily Delta outflow index of 11,400 cfs, for the number of days during each of the calendar months February through June, determined from the Sacramento-San Joaquin Unimpaired Flow index for the previous month using Table 2 (attached). If this standard is met for a greater number of days than the requirement for any month, the excess days shall be applied to meeting the requirement for the following month.

3. Roe Island: Maximum daily average electrical conductivity of 2.64 ms/cm, OR maximum 14-day average electrical conductivity of 2.64 ms/cm, OR minimum daily Delta outflow index of 29,200 cfs, for the number of days during each of the calendar months February through June, determined from the Sacramento-San Joaquin Unimpaired Flow Index for the previous month using Table 3 (attached); provided that this standard shall apply only in months when the average electrical conductivity at Roe Island during the 14 days immediately prior to the first day of the month is 2.64 ms/cm or less. If this standard is met for a greater number of days than the requirement for any month, the excess days shall be applied to meeting the requirement for the following month.

(b) Salinity at the Confluence shall be measurd at the Collinsville station, number RSAC081, maintained by the U.S. Bureau of Reclamation. Salinity at Chipps Island shall be measured at the Sacramento River at Mallard Slough station, number EOB80261551, maintained by the California Department of Water Resources. Salinity at Roe Island shall be measured at the Sacramento River at Port Chicago station maintained by the U. S. Bureau of Reclamation. The Department and the Bureau, respectively, shall be responsible for maintenance of their stations to ensure continuing accuracy of electrical conductivity measurements.

(c) The Sacramento/San Joaquin Unimpaired Flow Index shall be computed as the sum of flows at the following stations:

1. Sacramento River at Bend Bridge, near Red Bluff

2. Feather River, total inflow to Oroville Reservoir

3. Yuba River at Smartville

4. American River, total inflow to Folsom Reservoir

5. Stanislaus River, total inflow to New Melones Reservoir

6. Tuolomne River, total inflow to Don Pedro Reservoir

7. Merced River, total inflow to Exchequer Reservoir

8. San Joaquin River, total inflow to Millerton Lake

(d) The Delta Outflow Index shall be estimated and published daily by the Department of Water Resources and Bureau of Reclamation using the method specified in Table 4 (attached).

2. The State Board authorizes the Executive Director, or his designee, to revise and amend the 1991 Bay-Delta Water Quality Control Plan or other state water quality control plans as necessary to incorporate the estuarine habitat standard adopted pursuant to this resolution.

3. The State Board authorizes the Executive Director, or his designee to transmit the amended 1991 Bay-Delta Water Quality Plan, or appropriate portions thereof, to the U.S. Environmental Protection Agency ("EPA") as necessary to comply with applicable provisions of the Clean Water Act.

[CERTIFICATION]

Table 1
Requirement at Confluence

The number of days specified in paragraph a(1) shall be determined each month, February through June, based on the previous calendar month's value of the Sacramento/San Joaquin Unimpaired Flow Index, using the following table. The number of days for values of the Sacramento/San Joaquin Unimpaired Flow Index between those shown shall be determined by linear interpolation.

Sacramento/ San Joaquin Unimpaired Flow Index for previous month, Thousand acre-feet	Number of Days During Calendar Month				
	February	March	April	May	June
< = 500	0	0	0	0	0
750	28	8	0	0	0
1000	28	31	0	0	0
1250	28	31	24	0	0
1500	28	31	30	31	0
1750	28	31	30	31	0
2000	28	31	30	31	0
2250	28	31	30	31	1
2500	28	31	30	31	5
2750	28	31	30	31	15
3000	28	31	30	31	25
3250	28	31	30	31	28
> = 3500	28	31	30	31	30

Table 2
Requirement at Chipps Island

The number of days specified in paragraph a(2) shall be determined each month, February through June, based on the previous calendar month's value of the Sacramento/San Joaquin Unimpaired Flow Index, using the following table. The number of days for values of the Sacramento/San Joaquin Unimpaired Flow index between those shown shall be determined by linear interpolation.

Sacramento/ San Joaquin Unimpaired Flow Index for previous month, Thousand acre-feet	Number of Days During Calendar Month				
	February	March	April	May	June
<= 500	0	0	0	0	0
750	28	0	0	0	0
1000	28	12	2	0	0
1250	28	31	6	0	0
1500	28	31	13	0	0
1750	28	31	20	0	0
2000	28	31	25	1	0
2250	28	31	27	3	0
2500	28	31	29	11	1
2750	28	31	29	20	2
3000	28	31	30	27	4
3250	28	31	30	29	8
3500	28	31	30	30	13
3750	28	31	30	31	18
4000	28	31	30	31	23
4250	28	31	30	31	25
4500	28	31	30	31	27
4750	28	31	30	31	28
5000	28	31	30	31	29
5250	28	31	30	31	29
>= 5500	28	31	30	31	30

Table 3
Requirement at Roe Island

The number of days specified in paragraph a(3) shall be determined each month, February through June, based on the previous calendar month's value of the Sacramento/San Joaquin Unimpaired Flow Index, using the following table. The number of days for values of the Sacramento/San Joaquin Unimpaired Flow index between those shown shall be determined by linear interpolation.

Sacramento/ San Joaquin Unimpaired Flow Index for previous month, Thousand acre-feet	Number of Days During Calendar Month				
	February	March	April	May	June
0	0	0	0	0	0
250	1	0	0	0	0
500	4	1	0	0	0
750	8	2	0	0	0
1000	12	4	0	0	0
1250	15	6	1	0	0
1500	18	9	1	0	0
1750	20	12	2	0	0
2000	21	15	4	0	0
2250	22	17	5	1	0
2500	23	19	8	1	0
2750	24	21	10	2	0
3000	25	23	12	4	0
3250	25	24	14	6	0
3500	25	25	16	9	0
3750	26	26	18	12	0
4000	26	27	20	15	0
4250	26	27	21	18	1
4500	26	28	23	21	2
4750	27	28	24	23	3
5000	27	28	25	25	4
5250	27	29	25	26	6
5500	27	29	26	28	9
5750	27	29	27	28	13
6000	27	29	27	29	16

Table 3 (cont.)

Sacramento/ San Joaquin Unimpaired Flow Index for previous month, Thousand acre-feet	Number of Days During Calendar Month				
	February	March	April	May	June
6250	27	30	27	29	19
6500	27	30	28	30	22
6750	27	30	28	30	24
7000	27	30	28	30	26
7250	27	30	28	30	27
7500	27	30	29	30	28
7750	27	30	29	31	28
8000	27	30	29	31	29
8250	28	30	29	31	29
8500	28	30	29	31	29
8750	28	30	29	31	30
9000	28	30	29	31	30
9250	28	30	29	31	30
9500	28	31	29	31	30
9750	28	31	29	31	30
>= 10000	28	31	30	31	30

Table 4
Delta Outflow Index

The Delta Outflow Index (DOI) shall be computed daily by the California Department of Water Resources and the U. S. Bureau of Reclamation using the following formula (all flows are in cubic feet per second):

DOI = DELTA INFLOW - NET DELTA CONSUMPTIVE USE - DELTA DIVERSIONS

where DELTA INFLOW = SAC + SRTP + YOLO + EAST + MISC + SJR, and

SAC = Sacramento River at Freeport mean daily flow for the previous day; the 25-hour tidal measurements from 12:00 midnight to 1:00 a.m. the following day may be used instead;

SRTP = Sacramento Regional Treatment Plant average daily discharge for the previous week;

YOLO = Yolo Bypass mean daily flow for the previous day, which is equal to the flows from the Sacramento Weir, Fremont Weir, Cache Creek at Rumsey and the South Fork of Putah Creek;

EAST = Eastside Streams mean daily flow for the previous day from the Mokelumne River at Woodbridge, Cosumnes River at Michigan Bar, and Calaveras River at Bellota;

MISC = Combined mean daily flow for the previous day of Bear Creek, Dry Creek, Stockton Diverting Canal, French Camp Slough, Marsh Creek and Morrison Creek; and

SJR = San Joaquin River flow at Vernalis, mean daily flow for the previous day; and

where NET DELTA CONSUMPTIVE USE = GDEPL - PREC, and

GDEPL = Delta gross channel depletion for the previous day based on water-year type using the Department of Water Resources' most recent land use study; and

PREC = Real-time Delta precipitation runoff for the previous day, estimated from stations within the Delta; and

where DELTA DIVERSIONS = CCF + TPP + CCC, and

CCF = Clifton Court Forebay inflow for the current day;

TPP = Tracy Pumping Plant pumping for the current day; and

CCC = Contra Costa Canal pumping for the current day.

APPENDIX 2

RECOMMENDATIONS REGARDING THE ANALYSIS OF THE ECONOMIC IMPACTS OF ESTUARINE PROTECTION STANDARDS AND OTHER REQUIREMENTS

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In the notice for its July 13, 1994 Workshop, the State Water Resources Board ("State Board") requested input on a number of important questions concerning the analysis of economic impacts arising from proposed standards and other estuarine protection measures. The California Urban Water Agencies ("CUWA") believe that these questions do not cover the broad range of issues, however, that must be addressed in the State Board's analysis. In this Appendix, various recommendations are made for the State Board to consider in estimating economic impacts.

Recommendation No. 1

The State Board Should Develop a "Without Standards" Condition to Determine the Availability of Water Before New Standards Are Put in Place

The starting point for analyzing the impact of alternative water quality standards is establishing a "without standards" condition, or "base case." The development of the base case should address four factors: (1) the time-period for the analysis; (2) the level of water supplies and demands; (3) the facilities to be assumed as existing; and (4) the availability of water for transfers. Each of these factors are addressed below.

A. Time Period for Analysis - Focusing on Both Short- and Long-Term Impacts

In the long-term, water supply agencies and consumers can take actions which may somewhat mitigate the water supply impacts of the proposed standards. These actions may include investing in more costly conservation programs, water purchases, water reclamation, participation in a mitigation credits program, or other programs. All of these options, if available, take time to be implemented. The short-term effects of the standards are therefore likely to be more severe than the long-term effects.

The analysis should examine the consumer demand for water in each of these time-frames, and the plans the urban agencies have made to meet those demands. These mandatory reductions typically include an expected level of shortages that will be incurred under base conditions.

B. Water Supply and Demand - Focus on Full Historic Hydrology and Pre-Existing Restrictions.

In determining the base case water supply situation, the State Board should recognize the variability of supply which is inherent in the full 71 years of the hydrologic record. In addition, the State Board's analysis should recognize other existing restrictions on water supply. These include: the outflow requirements of D-1485; flow and other restrictions imposed by the National Marine Fisheries Service ("NMFS") to protect the delta smelt; and the effect on supplies arising from the Central Valley Project Improvement Act ("CVPIA") requirements.

C. Facilities - Focus Explicitly on Facilities Assumed To Be Available to Mitigate the Effect of Requirements

The State Board must determine explicitly which facilities will be assumed to be available to meet present and future water supply requirements. These facilities should be those that can reasonably be expected to be completed in the time-frame of the study. In the short-run analysis the State Board should assume only the existing facilities, while in the long-run additional facilities could be assumed. However, these should only include those facilities which have a strong probability of being constructed before the year of the analysis. In particular, facilities assumptions should be consistent with constraints arising from designation of the Delta as critical habitat for the delta smelt and winter-run salmon.

D. Water Transfers - Focus on the "Without Standards" Requirement for Water Transfers

The analysis of the "without standards" condition should determine the level of water transfers that will be required under the water agencies' plans to meet their consumers' demands. Some urban agencies have plans to obtain transfers which will be in effect only during "dry" or "critically dry" years, so the State Board's analysis should recognize the variation in the level of transfers which will be required in the "without standards" case.

In determining the level of transfers to assume for the without standards case, the State Board should also take into account existing constraints on the availability of transfers. These constraints include:

- The physical constraints of the existing facilities. Before transfers can be assumed, a check must be made to ensure the capacity exists to transport that water to where it is needed.

- Existing regulatory restrictions (such as D-1485 and the "take" limitations in the Delta) on facilities used to deliver transferred water.

- Existing uses of those facilities. Contract deliveries through the Delta facilities should be assumed to take precedence over transferred water.

- The timing of transfers. Initial analysis of available Delta pumping capacity suggests that water transfers may be most readily obtained during fall months. The ability to make use of transferred water may therefore be restricted to those agencies which have access to sufficient storage to accept the transferred water and hold it until it is needed.

- The legal and institutional impediments to transfers. There are still many institutional and legal barriers which will inhibit the ability to buy and sell water. The State Board's analysis should not fail to recognize these restrictions.

Recommendation No. 2

The State Board Should Develop a Range of "With Standards" Conditions to Estimate the Availability of Water When the New Standards Are Put in Place.

The second step in the State Board's analysis should be to determine the water supply impacts of the proposed standards. The State Board has yet to determine how any standards will be implemented. The analysis should therefore reflect a range of implementation options so as to reflect the range of possible economic impacts that may result from the standard. This should include an analysis of economic impacts on all agencies which might be affected.

The State Board should modify the "base case" water supply situation to reflect reductions arising from the requirements. These modifications will lead to reduced water supplies for particular supplying agencies. The impact on these water supply agencies should be examined by investigating the least cost alternative supplies available to those agencies. These alternatives and their costs will vary by agency, because of the unique configuration of each of these systems. In some cases, the effect of the requirements may be to reduce costs because of increased water quality.

The State Board should also identify any increased shortages which result from the requirements, and evaluate the costs of those shortages. In undertaking this evaluation, the State Board must take into account that costs of shortages vary by the type of consumer being impacted by the shortage. Representatives of industry have appeared before the State Board to state their deep concern over unreliable water supply. Existing studies document these high

costs.1/ The State Board must either reflect these high costs in its analysis, or explicitly assume that industry is protected from shortages and that other customers must bear the burden for this protection.

Finally, the State Board should review the economic benefits available from an active water market. The State Board should discuss the impediments to the development of this market, and identify the steps needed to remove those impediments. The analysis should also consider the economic benefits of allowing water users to purchase the water needed to meet the requirements, rather than meeting those requirements solely through reductions in their own water supplies.

Recommendation No. 3

The State Board's Economic Analysis Should Consider the Costs of Water Supply Uncertainty

The proposed regulations may make the urban water supply less reliable. This increased uncertainty has costs of its own, which should be recognized. As water supplies become less reliable, California industries will find it more difficult to justify expansion of their existing facilities, and industries considering relocation to California may be deterred. Existing small businesses and farms may have greater difficulty obtaining financing because their level of production may be limited by the availability of water. Water supply agencies may also have difficulty obtaining financing, because of increased uncertainty over future revenue levels.

Where financing is obtainable, the added perception of risk could increase financing costs. This could triple beyond the state and to municipal borrowers that are not water suppliers. Bond rating agencies use the Metropolitan Water District of Southern California ("MWD") as a benchmark for interest rates to municipal agencies throughout the western states. A downgrading of MWD's bond rating could have a negative effect on all of these borrowers.

Recommendation No. 4

The State Board Should Institute a Process Which Includes Interested Parties in the Development of the Economic Impact Estimates

The economic analysis outlined above is complex, and relies on details of water supply agency costs, options and strategies. It would be difficult and time-consuming for the

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1/ These include The Cost of Industrial Water Shortages by CUWA, and a study now being completed by the City of San Francisco.

State Board to collect and evaluate these data without assistance from the agencies concerned. In conducting its revision of the Regulatory Impact Analysis, the EPA has set a valuable precedent in the level of involvement it allows interested parties. The urban agencies plan to continue to work with EPA to assist in refining its analysis. During the month of August, the urban agencies will be supplying EPA with data and analysis reflecting the EPA's assumptions concerning the standards. At the completion of this effort, in early September CUWA intends to provide the State Board's economist with a review of the EPA's approach, and what areas CUWA believes require additional analysis. CUWA urges the State Board to continue EPA's approach of working with the interested parties to obtain the most complete and accurate data and analysis in conducting its study. CUWA remains willing to cooperate with the State Board staff in its conduct of this analysis.

EXECUTIVE SUMMARY

The State Water Resources Control Board ("State Board") has asked for recommendations on standards and other regulatory strategies to protect the environmental health of the San Francisco Bay-Sacramento and San Joaquin River Delta Estuary ("Bay-Delta"). The recommendations offered in this submittal represent the efforts of the California Urban Water Agencies ("CUWA") to respond to the State Board's request. CUWA represents California's eleven largest urban water agencies, and much of the water supplied by these agencies ultimately is derived from the Bay-Delta watershed.

CUWA believes that these recommendations should be used as the framework for a coordinated regulatory program to restore and preserve the ecology of the Bay-Delta system. The recommendations take into account the range of beneficial uses derived from this important environmental resource. They reflect scientific input from numerous technical sources, and they have been circulated for review to a number of urban, agricultural, and environmental interests around the state. Taken together, they offer a scientifically defensible and practical approach to protecting the environmental character and quality of the Bay-Delta ecosystem.

An important principle underlying CUWA's approach is the need to adopt effective standards for estuarine protection. CUWA strongly supports the State Board's adoption of appropriate standards as soon as practicable. At the same time, however, CUWA believes that standards alone will not be sufficient to restore the environmental vitality of the Bay-Delta. Consequently, CUWA proposes that necessary standards be adopted only within the context of a well-designed, Coordinated Estuarine Protection Program that consists of several different, but inter-related regulatory strategies.

The recommendations offered here can be grouped into three categories, which together comprise CUWA's proposed coordinated program:

(1) Estuarine habitat standards. This includes water quality criteria incorporating a modified version of the "X-2" salinity standard that has been proposed by the U.S. Environmental Protection Agency ("EPA").

(2) Multi-species protection requirements. This includes requirements for managing Delta inflow and outflow as well as other operations, in order to provide supplemental habitat protection for a variety of estuarine species.

(3) Regulatory actions to control additional bio-degradation factors. This includes additional, non-outflow related measures to control factors affecting the Bay-Delta that cannot be addressed through requirements addressing salinity and flow alone.

CUWA's recommendations recognize that some actions (e.g., the adoption of standards) both can and should be taken before others (e.g., the completion of necessary water rights proceedings). Consequently, the recommendations contemplate a phased approach to program implementation in order to achieve required levels of estuarine protection as early as possible. The use of a phased approach is necessary to develop the additional information and resources that may be needed for adoption of certain regulatory actions. It is not intended, however, to allow prolonged or indefinite deferral of those actions, each one of which is essential to the ultimate success of the coordinated program.

CUWA's recommendations envision the use of various mechanisms, including water supply impact caps, mitigation credits, and an environmental mitigation fund, to provide incentives and promote a reasonable allocation of responsibility for meeting program requirements among all responsible entities. CUWA also recommends that existing regulatory and environmental monitoring activities be supplemented and integrated to ensure that implementation of the program achieves its goal of restoring and preserving conditions in the Bay-Delta. Finally, several recommendations are offered for evaluating the economic impacts of proposed standards and other management measures.

CUWA's recommendations emphasize actions that can be taken or directed by the State Board under existing provisions of state law. CUWA believes, however, that these actions must be part of a comprehensive ecosystem management plan to address the full range of issues facing the Bay-Delta. While some elements of this comprehensive plan already are underway, other regulatory, planning, and resource management programs will need to be developed by different agencies and organizations. CUWA encourages the State Board to take a leadership role in ensuring that these programs move forward, to the benefit of all who depend upon the myriad resources this important ecosystem provides.

CUWA believes that the recommendations contained in this submittal will achieve the environmental objectives underlying EPA's proposed standard. Therefore, CUWA strongly encourages the State Board and the regional water quality control boards to address the water quality and water quantity issues contributing to the decline of estuarine habitat in the Bay-Delta, by utilizing their full authority under state and federal law and implementing CUWA's proposed Coordinated Estuarine Protection Program.

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INTRODUCTION

The California State Water Resources Control Board ("State Board" or "Board") is seeking input on the development of standards and water quality control strategies for the San Francisco Bay-Sacramento and San Joaquin River Delta Estuary ("Bay-Delta"). The California Urban Water Agencies ("CUWA") has prepared a coordinated set of Recommendations, including specific proposals for Bay-Delta standards, to assist the State Board in that effort.1/

CUWA represents California's eleven largest urban water agencies, serving over 20 million consumers and three-quarters of the state's economic activity. Much of the water supplied by CUWA member agencies ultimately is derived from the Bay-Delta watershed. Consequently, CUWA and its members have a compelling interest in ensuring that any regulatory strategy adopted by the State Board fully takes into account the needs of all reasonable and beneficial uses that depend upon the water and other resources provided by the estuary.

The Bay-Delta is a highly altered estuarine system. Beginning with its conversion from marshland to channels and islands in the last century, the Bay-Delta has experienced a variety of changes affecting its capacity to provide adequate habitat conditions for the numerous fish and wildlife species that use the system. These changes include years of hydraulic mining and resultant siltation, the introduction of various exotic (non-indigenous) species, and increases in point source and non-point source pollution. They also include the construction and operation of numerous water supply projects, such as the Central Valley Project ("CVP") and the State Water Project ("SWP"), and various upstream water projects and diversions.

In recent years, the Bay-Delta has experienced declines in the population of a number of fish species, including delta smelt, chinook salmon, and striped bass. Some of these species have been listed or have been proposed for listing as endangered or threatened under federal and state endangered species protection laws. The State Board has adopted or proposed to adopt various measures to prevent the declines, but the continuation of the declines despite

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1/ CUWA member agencies include:

- Alameda County Water District
- Contra Costa Water District
- East Bay Municipal Utility District
- Los Angeles Department of Water and Power
- Metropolitan Water District of Southern California
- Municipal Water District of Orange County
- Orange County Water District
- San Diego County Water Authority
- San Diego Water Utilities Department
- San Francisco Public Utilities Commission
- Santa Clara Valley Water District

CUWA submitted extensive technical comments to EPA on various aspects of its proposed water quality standards. In addition, individual CUWA members and others, acting on their own behalf, submitted additional comments to EPA, based in part on CUWA's technical submissions. CUWA has been involved in periodic discussions with EPA and various environmental organizations regarding technical concerns raised by the proposed federal rule; however, there is no assurance that EPA will modify its proposed rule in response to those concerns. Moreover, as a result of a second stipulation and consent decree entered in the pending litigation on May 3, 1994, EPA is now required to promulgate a final rule by December 15, 1994.

In response to EPA's actions, the State Board announced its intent to proceed with a series of four workshops on Bay-Delta standards. Those workshops, conducted during the months of April-July 1994, have been used to gather information and recommendations to be considered by the State Board in developing its own standards. At the last workshop on July 13-14, 1994, CUWA and others indicated that substantial progress had been made in developing recommendations for alternatives to EPA's proposal, but that additional work still was required. As a result, the State Board announced a fifth workshop to be held on September 1-2, 1994, to receive input on alternative fish and wildlife standards and related issues.

In the meantime, various state and federal agencies having jurisdiction over Bay-Delta matters (including the State Board) have negotiated a memorandum of agreement (the "Framework Agreement") to establish common grounds for further regulatory action. The Framework Agreement assumes that:

(1) EPA will proceed with adoption of federal standards by the court-approved December 15, 1994 deadline;

(2) the State Board will proceed with the development of alternative standards based on information received during the ongoing workshops;

(3) the State Board will submit its proposed standards to EPA for review and approval as necessary under applicable provisions of the CWA;

(4) to the extent it approves the State Board's alternative, EPA will seek to withdraw its federally promulgated standards;

(5) the State Board will initiate a water rights proceeding for the purpose of allocating responsibility for compliance with adopted standards; and

(6) the State Board will seek agreement over interim compliance measures to be implemented by the SWP and the CVP pending the outcome of the water rights proceeding.

The Framework Agreement also recognizes that, as interim protections are put into place, there will be a shared state-federal interest in pursuing long-term solutions that adequately address the multiple environmental, economic, and water supply interests in the Bay-Delta ecosystem.

Taking into account the procedural guidance offered by the Framework Agreement, CUWA has prepared these Recommendations to respond to the State Board's request for recommendations on standards to be presented at the September 1, 1994 workshop.

B. Statement of objectives.

In light of EPA's proposal to adopt standards (and the history and circumstances leading up to EPA's proposal), it is important that any regulatory program for Bay-Delta protection address the following goals (among others):

(1) The program should include state water quality standards for estuarine habitat protection that would be approvable under the Clean Water Act in lieu of EPA's proposal.

(2) The program should include operational requirements to complement the use of water quality standards.

(3) The program should acknowledge the need for periodic review and revision of standards to accommodate changed conditions and consider new scientific and other information.

(4) The program should facilitate the State Board's separate process for determining the necessity of conditioning water rights to implement the program and for allocating water supply impacts from the program.

(5) The program should identify additional regulatory actions to be taken by the State Board and/or other agencies in addressing other factors affecting species viability in the Bay-Delta.

(6) Program elements should have a definite schedule of implementation and should allow implementation on a phased basis to ensure that appropriate regulatory issues are addressed first.

(7) Implementation of the program should eliminate uncertainties associated with actions under the ESA and other regulatory schemes.

(8) The program should be defensibly grounded on applicable provisions of the California Constitution, the Water Code, the California Administrative Procedures Act, the California Environmental Quality Act, and other statutory requirements.

(9) The program should be consistent with other measures required for restoration of the Bay-Delta ecosystem overall.

C. Overall approach.

The estuarine protection program proposed here includes three categories of related program elements to achieve the goals described above. The first category includes an estuarine habitat protection standard that incorporates a modified version of the "X-2" salinity standard that has been proposed by EPA. The second category encompasses a series of Delta inflow/outflow and other management requirements (including operational requirements applicable to the CVP and SWP) to provide supplemental protection to a variety of estuarine species. The third category includes regulatory actions to control additional "bio-degradation" factors that also affect the Bay-Delta but cannot be managed through requirements addressing salinity and flow alone.

CUWA's Recommendations contemplate a phased approach to program implementation in order to achieve estuarine protection as early as possible. They also envision the use of various mechanisms, including water supply impact caps, mitigation credits, and an environmental mitigation fund, to provide incentives and promote a reasonable allocation of responsibility for meeting program requirements among all responsible entities. Finally, CUWA recommends that existing environmental monitoring activities be refined, coordinated, and supplemented where necessary in order to ensure that implementation of the program is effective in achieving its goal of enhancing conditions in the Bay-Delta.

D. Implications for a Comprehensive Ecosystem Management Plan.

A number of agencies at all levels of government, as well as various non-governmental organizations and entities, have endorsed the concept of a comprehensive ecosystem approach toward solving the myriad problems facing the Bay-Delta. The Recommendations offered in this document are only one part of this approach. CUWA also recommends that a multi-species ecosystem approach toward long-term Bay-Delta protection be developed in connection with a joint state and federal process to develop a comprehensive water resources management plan for the estuary, addressing the many factors responsible for the decline in estuarine resources.

The elements of a Comprehensive Ecosystem Management Plan have not yet been fully defined. Nor has a consensus on an overall process been determined or responsibilities for its development been reached. CUWA has recommended that the State

Board begin this process in its formulation of a new water quality control plan for the Bay-Delta under the Porter-Cologne Water Quality Control Act ("Porter-Cologne Act"). CUWA also has stated its intent to assist in the development and promotion of a comprehensive plan for multi-species ecosystem management. CUWA would expect to define an appropriate role for water supply interests in the implementation of that plan.

There are many regulatory, planning, and resource management programs already underway that are critical elements of a comprehensive management plan. Additional programs have been identified but remain to be fully developed. Figure 1 provides a conceptual depiction of these different planning and management elements. As the figure demonstrates, there are many elements that are outside the scope of the State Board's current effort to develop standards and other regulatory mechanisms for Bay-Delta protection.

In the present context, the State Board must focus on those actions that it has authority to take under the Porter-Cologne Act and other provisions of the Water Code. The State Board should remain mindful, however, of the relationships between those actions and other comprehensive management plan elements. Thus, any coordinated estuarine protection program should identify the role of the State Board and the affected regional water quality control boards vis-a-vis those elements. It should also identify and encourage implementation of actions subject to the authority of other entities that must be involved in comprehensive management efforts. CUWA believes that the Framework Agreement provides a process for the development of the Comprehensive Ecosystem Management Plan that implements the applicable state and federal environmental laws, policies, and regulations.2/

2/ In addition, the recently-announced Department of the Interior policies regarding prelisting agreements for terrestrial habitat should be extended to aquatic habitat and should apply to federal and state actions taken with respect to Bay-Delta protection.

- **The Need for Coordination With Other Program Elements**

  Because EPA is purporting to act solely pursuant to authority under section 303 of the Clean Water Act, the standards it has proposed to adopt are necessarily limited in scope. EPA does not have authority to prescribe actions to implement those standards. Nor does it have authority to direct the State Board or other state or federal agencies to address other factors that may significantly affect the environmental health of the Bay-Delta. Consistent with the Framework Agreement recently executed between the State of California, EPA, and other federal agencies regarding Bay-Delta protection, CUWA believes that any standards adopted by the State Board should recognize and facilitate further actions required to be taken as part of a coordinated estuarine protection program.

B. Proposed approach.

Consistent with the general principles outlined above, CUWA proposes adoption of an estuarine habitat standard that incorporates the same 2 ppt salinity criterion proposed by EPA, but applies that criterion in different and biologically more appropriate ways. The standard would be applied in concert with a series of management requirements, including operational controls for Delta inflow and outflow for multi-species protection. Compliance with the standard would be evaluated through the implementation of a coordinated and expanded estuarine monitoring program.

CUWA's proposed estuarine habitat standard specifically would include the following:

a. An overall objective requiring that the quality of waters in the Bay-Delta be maintained consistent with that level necessary to protect estuarine habitat, fish migration, cold freshwater habitat, and other existing beneficial or designated uses. (The baseline level of habitat protection to be used in evaluating attainment of this objective would be that existing generally in the estuary during the period between 1968 and 1975.)

b. A set of alternative numeric criteria to meet the required level of habitat protection through attainment of

   - maximum daily average salinity of 2 ppt, OR
   - maximum 14-day average salinity of 2 ppt, OR
   - minimum daily Delta outflow index criteria,

at the same locations used in EPA's proposed standards (confluence of the Sacramento and San Joaquin Rivers, Chipps Island, and Roe Island) for a specified number of days from February 1 through June 30 of each year, with the number of days of required compliance in any given month to be determined using a sliding scale calculation based upon Sacramento and San Joaquin unimpaired flow indices for the previous month. (The CUWA sliding scale calculation is based on the mid-point of the 1968-75 time period used for establishing the required level of habitat protection.)

A proposed standard incorporating this approach is provided in Appendix 1. This proposal would achieve broad protection of estuarine habitat by defining the level of protection required expressly in terms of habitat-dependent beneficial uses. The salinity and flow criteria used in the proposal would provide specific and numerically verifiable measures of habitat protection based upon actual hydrologic conditions that change over time.

This proposal includes several modifications to EPA's originally proposed standard that are intended to enhance habitat protection while making the standard more realistic and workable. The inclusion of flow criteria in CUWA's proposal provides an enforceable standard at times when salinity variations due to uncontrollable, short-term meteorological events might otherwise result in exceedences. CUWA's proposal also reflects the inherent hydrologic variability of the estuary by using the sliding scale approach in setting flow and salinity requirements, which can fluctuate on a month-by-month basis based upon measured historical experience.

By setting habitat protection as an overall objective, the proposed standard offers a base level of protection for a broad range of estuarine species. The standard would not function effectively in isolation, however. The proposal assumes that additional measures, e.g., operational measures and measures to address other bio-degradation factors, will be necessary to complement the baseline protection that the standard offers.

The scientific, technical, and regulatory rationale underlying CUWA's proposed estuarine habitat standard, as well as its implications for multi-species protection requirements, is discussed further below.

C. Scientific and technical rationale.

As part of its initial review of EPA's proposed salinity standard, CUWA conducted an intensive review of the foundational scientific literature and data upon which the

standard was based. This included an evaluation of:

(1) the fish abundance index -- X-2 relationships cited as justification for the standard;

(2) California Department of Fish and Game ("CDFG") fall mid-water trawl data base that was used, in part, in developing the biological X-2 relationships;

(3) potential habitat gains and losses that might occur to wide range of species that utilize the Bay-Delta as a result of implementation of the salinity standard at the Confluence, Chipps Island, and Roe Island; and

(4) factors other than salinity which have as much or more of an effect on the aquatic resources and which therefore warrant regulatory consideration by the State Board.

Based on the above analysis, CUWA concluded that the data in general supported the development of a salinity standard at both the Confluence and Chipps Island control points, but not at Roe Island. At these first two locations, the relationships between X-2 and abundance indices (for most of the target species) appear strong and explain much of the variability in the abundance indices for many organisms. CUWA believes that application of a standard at the Confluence that is set at a constant 150 days is unnecessarily rigid, however, and would reduce the overall variability in X-2 that is important for maintaining estuarine health. In addition, modelling analysis suggests that it could have significant water supply impacts in critical drought years.

CUWA therefore proposes a sliding scale approach for implementing any salinity standard for the estuary. CUWA's proposed standard incorporates this approach by setting the number of days of compliance required at any compliance point based on unimpaired Sacramento and San Joaquin River flow indices and derived in a statistically similar way for all compliance points.

CUWA's original habitat-based analysis also suggested that only minor gains in habitat (based on salinity) would occur for some species of fish at the Roe Island location compared with that already achieved at Chipps Island. In addition, potentially adverse effects could occur for other species. The results of CUWA's preliminary analysis of factors (other than salinity or flow) that potentially affect the Bay-Delta ecosystem were presented to the State Board during the June 14 workshop. CUWA remains concerned that these factors significantly affect the aquatic resources in the system, in some cases potentially more so than salinity and outflow.

CUWA believes, however, that given currently available information, application of a standard at Roe Island (incorporating the sliding scale approach and other modifications) is appropriate when implemented to preserve the natural, inter- and intra-annual

variability of X-2, which is biologically important to estuarine health. CUWA recognizes that from a biological perspective, a Roe Island standard (modified as described) would promote natural variability in hydrology and salinity to the system, and might prove beneficial to the Bay-Delta aquatic biota. Consequently, unless additional analyses indicate significant potential negative impacts to estuarine species, CUWA supports an estuarine habitat standard that includes a modified Roe Island X-2 standard.

D. Regulatory framework.

The estuarine habitat standard proposed by CUWA would achieve the same objectives underlying EPA's proposed numeric standards. Moreover, CUWA's approach would better ensure necessary conservation of the biological resources of the Bay-Delta while accommodating other, competing uses of water from the estuary (including the provision of reliable water supplies). The need to accommodate competing uses is clearly part of the State Board's statutory mandate and must be considered as part of any regulatory approach adopted in this context. See United States v. State Water Resources Control Bd., 182 Cal. App. 3d 82, 116 (1986) ("The Board's obligation is to attain the highest reasonable water quality considering all demands being made and to be made on those waters . . . ." (emphasis in original)).

While the Porter-Cologne Act expressly provides for the adoption of standards and implementation plans to the extent deemed necessary to reasonably protect beneficial uses, it does not prescribe the specific regulatory format that State Board standards must take. The estuarine habitat standards proposed by EPA are essentially numeric water quality criteria developed to protect certain designated uses of the Bay-Delta. Strictly numeric criteria are not the only legitimate approach, however. In some cases, the use of narrative or combined narrative and numeric standards may be warranted and preferable. Indeed, the use of a combined approach has been specifically approved by EPA and endorsed by the courts as the best way to address flow-related salinity impacts under certain circumstances. See Environmental Defense Fund, Inc. v. Costle, 657 F.2d 275 (D.C. Cir. 1981) (approving state water quality standards for salinity that included narrative criteria, a plan of implementation, and other factual information on salinity in the Colorado River).

The validity of using non-numeric water quality standards recently has been confirmed by the United States Supreme Court. In Jefferson County PUD v. Ecology Dep't of Washington, No. 92-1911, 1994 U.S. LEXIS 4271 (May 31, 1994), the Court explicitly approved the use of narrative water quality standards adopted pursuant to section 303 of the Clean Water Act. Relying in part on EPA's own interpretation of the federal statute, the Supreme Court rejected the notion that section 303 standards must always be expressed numerically. The Court noted that

> EPA has not interpreted section 303 to require the States to protect designated uses exclusively through enforcement of numerical criteria. In its regulations governing state water quality standards, EPA defines criteria as "elements of State

> water quality standards expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use." 40 C.F.R. section 131.3(b) (1992) (emphasis added). The regulations further provide that "when criteria are met, water quality will generally protect the designated use." Ibid. (emphasis added). Thus, the EPA regulations implicitly recognize that in some circumstances, [numerical] criteria alone are insufficient to protect a designated use.

Jefferson County PUD, 1994 U.S. LEXIS 4271, at 25-26. See also Environmental Defense Fund v. Costle, 13 Env't Rep. Cas. (BNA) 1867, 1871 (D.D.C. 1979) (stating that the Clean Water Act "nowhere requires the establishment of criteria in numerical form; criteria may be entirely narrative").

In light of the Supreme Court's decision in Jefferson County PUD, it is clear that the State Board can adopt the approach to estuarine habitat protection reflected in CUWA's proposed standard. The proposal includes a broadly defined, narrative water quality criterion based on designated, estuarine-related beneficial uses. It also provides specific and verifiable mechanisms for determining attainment of the standard. CUWA therefore believes that its proposed standard represents the best approach toward estuarine habitat protection and should be adopted by the State Board.

E. Implications for multi-species protection.

In addition to its proposed salinity standard for estuarine habitat protection, EPA has proposed specific standards to benefit individual fish species (Central Valley salmon and striped bass). CUWA believes that separate standards for individual species, beyond those included in the State Board's 1991 Water Quality Control Plan, are not warranted and are not consistent with the ecosystem approach now endorsed by federal agencies. In particular, CUWA does not believe that additional species-specific standards for the protection of striped bass and salmon smolt are necessary at this time. Instead, CUWA believes the State Board should focus on the identification of a series of management requirements, including but not limited to water project operational controls and other non-outflow related measures, that can provide enhanced protection for multiple fish and wildlife species.

1. Striped bass.

EPA has proposed adoption of a species-specific standard that would expand striped bass spawning habitat on the San Joaquin River. CUWA believes that additional protection criteria for striped bass spawning is not necessary and could have significant adverse impacts on various native aquatic species. Evidence presented for the 1991 Water Quality Plan highlighted the fact that spawning habitat is not a limiting factor for the existing striped bass population level. See State Water Contractor's Exhibit No. 623. Expanding spawning habitat

unnecessarily would likely lead only to greater entrainment of striped bass eggs and larvae at federal, state, and local diversions and not to increases in adult populations. Consequently, CUWA's proposed X-2 standard will increase and move the rearing habitat of striped bass juveniles, leading to less entrainment at project pumping stations.

More importantly, it is not clear that increasing population levels would be desirable in light of the predatory impacts which bass are now recognized to have on other species in the estuary -- particularly the delta smelt, winter-run chinook salmon, and San Joaquin fall-run salmon. While EPA has suggested that striped bass spawning habitat in the San Joaquin River needs to be improved during April and May, improved habitat conditions would increase the likelihood that large striped bass will be present in the Delta and its tributaries at the same time that salmon smolts are outmigrating, subjecting the smolts to increased predation.4/ Consequently, CUWA opposes adoption of a species-specific standard for striped bass protection at this time.

2. Salmon smolt survival.

CUWA agrees that further action is required to enhance salmon smolt survival. CUWA does not believe that the issue of salmon smolt survival should be addressed through a specific numeric standard, however, such as the Salmon Smolt Survival Index ("SSSI") standard proposed by EPA in January 1994.

CUWA has suggested that the salmon smolt index model used by EPA to develop its proposed SSSI is not numerically equal to survival. In addition, the model does not adequately reflect smolt survival as it is affected by a wide range of conditions and operational and facility management considerations and other conditions. CUWA believes that the State Board shares its concern that the draft SSSI standard proposed by EPA is not technically valid and that compliance with the standard as proposed would be impossible under some circumstances. See State Board Comments on EPA's Draft Standard, pp. 34-35 and 45-47; Comments of the Bay-Delta Urban Coalition on the January 6, 1994 Proposed Rule on Bay-Delta Standards, p. 28; and Technical Comments on Proposed Water Quality Standards for the San Francisco Bay-Delta prepared by California Urban Water Agencies, p. 31.

Over the last several months, however, CUWA has met with government agencies and various environmental groups to discuss CUWA's concerns with the EPA proposal and potential alternatives to it. See W. Kimmer, "Setting Goals for Salmon Smolt Survival in the Delta and Discussions on the Proposed EPA Salinity Standard" (August 10, 1994). These discussions have achieved consensus on several issues:

4/ For this reason, Dr. Peter Moyle has recommended that additional measures to protect striped bass be deferred until there is been significant recovery of native species. See San Francisco Public Utilities Commission comments to EPA regarding Proposed Federal Water Quality Standards for the San Francisco Bay-Sacramento-San Joaquin River Delta (March 11, 1994).

- First, the survival of salmon smolts as they pass through the Delta is a significant problem, and one worth considerable effort to solve.

- Second, while a salmon smolt survival goal based on actual salmon smolt survival indices may be desirable, a salmon smolt survival index should not itself be used as the basis of any standard.

- Third, a standard should be established consisting of a set of implementation measures or management requirements needed to achieve a survival goal.

- Fourth, compliance with the standard should be based upon implementation of measures identified as necessary for achieving the survival goal.

To date, discussions have not produced agreement on a specific salmon smolt survival goal. Nor is CUWA prepared at present to recommend a specific goal. Despite the lack of a specific goal, however, CUWA believes that there is a great need to enhance conditions for a range of estuarine species, including salmon. CUWA therefore recommends that the State Board adopt and require the implementation of management requirements, including operational measures, designed to improve conditions for migratory fish as well as other estuarine species.

3. Proposed approach.

CUWA recommends that the State Board promptly initiate a process that will lead to the identification of management requirements to protect salmon smolt survival, steelhead migration, and other estuarine species (including, to the extent appropriate, striped bass). While comparing actual salmon smolt survival with a salmon smolt survival goal could be used to evaluate the success of recommended management requirements, compliance with the standard should be based on the extent to which those measures are fully effectuated.

CUWA's recommendations regarding the development of appropriate management requirements for multi-species protection are discussed more fully in Section II, below.

II. WATER INFLOW/OUTFLOW AND OTHER MANAGEMENT REQUIREMENTS.

Water inflow/outflow and other management requirements comprise the second element of CUWA's proposed coordinated estuarine protection program. Unlike the estuarine habitat standard proposed in Section I, which is intended to provide an alternative to the regulatory standards proposed by EPA, some of the measures proposed here are clearly outside EPA's jurisdiction. Nevertheless, CUWA believes these measures are an integral part of a State Board program to achieve estuarine protection in the Bay-Delta under the Porter-Cologne Act.5/

A. Guiding principles.

In addition to those principles underlying the proposed estuarine habitat standard, CUWA believes that the State Board also should take into account the following principles when adopting management requirements intended to enhance estuarine protection:

- **The Need to Minimize Adverse Impacts to Water Uses**

  Additional estuarine protection measures must be consistent with the public interest and consider other demands being made on Bay-Delta waters. Unanticipated hydrologic events and other uncertainties inherent in the development of strategies to carry out management requirements can result in a high risk of unforeseen water supply impacts. These impacts can have significant adverse social, economic, and environmental impacts. Any requirements that ultimately are adopted should attempt to minimize and mitigate against water supply risks and facilitate water transfers.

- **The Need for Inter-Agency Coordination**

  Implementation of all necessary requirements may not be within the jurisdiction of the State Board or may duplicate actions by other agencies. For example, some measures already are being undertaken by the U.S. Bureau of Reclamation and the State Department of Water Resources ("DWR") at the federal and state water projects pursuant to endangered species act requirements

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5/ While identification of requirements is an appropriate exercise of the State Board's regulatory authority under the Porter-Cologne Act, imposition of some of these requirements may require the initiation of quasi-judicial water rights proceedings under separate provisions of the Water Code.

outside the State Board's authority. The State Board should clearly delineate those areas where it has authority to act and make specific recommendations for other agency actions where appropriate. It also should avoid taking actions that would be duplicative of the efforts of other administrative agencies.

B. Proposed approach.

CUWA proposes that the State Board approve specific management requirements to complement the estuarine habitat standard proposed in Section I.

Various proposals have been developed by different parties regarding possible operational measures to be considered by the State Board, but so far there is no clear consensus as to which proposal has the greatest merit. Therefore, CUWA is not yet prepared to offer specific proposals for each measure. CUWA scientists have had discussions with their counterparts at various governmental agencies and environmental groups to consider the types of measures that would enhance estuarine protection. CUWA intends to continue these discussions and to come back to the State Board with a set of additional recommendations for specific operational requirements that will reflect as much consensus as possible. CUWA requests that the State Board keep the administrative record open until October 28, 1994, to allow further discussions among CUWA staff and consultants, government scientists, and the agricultural and environmental communities.

Specific measures that CUWA is likely to address with its additional recommendations to the State Board include the following:

- **Delta Cross Channel gate closures**

Selective closure of the Delta Cross Channel has been identified as one of the highest priority actions needed to protect certain migratory fish.

- **Barriers at Old River and other locations**

It generally is thought that the installation of acoustical or physical barriers at the head of Old River and other locations in the Bay-Delta would help reduce delays in emigration and entrainment losses of juvenile salmon and steelhead.

- **Flow requirements**

Freshwater flows into and from both the Sacramento and the San Joaquin Rivers are needed for estuarine protection. Minimum flows and transport flows have been suggested as measures to improve habitat for various species. Flows provide a homing vector for upstream migrating fish and also carry eggs, larvae, and young migrants downstream.

- **Export restrictions**

Delta exports have direct and indirect impacts on estuarine protection. Direct fishery losses at the pumping facilities, along with induced Delta channel flow changes, need to be addressed with appropriate measures. There also is a nexus between export and barrier-related measures and flow measures.

III. REGULATION OF BIO-DEGRADATION FACTORS

In addition to the estuarine habitat standard and management requirements described above, CUWA believes that the State Board should address other, non-outflow related bio-degradation factors as part of a coordinated estuarine protection program. These factors include:

1. Unscreened water diversions in the Sacramento River and other locations.

2. Waste discharge control and pollution prevention (including pesticides).

3. Legal fishing (sport fishing & commercial harvest).

4. Illegal fishing (poaching control).

5. Land-derived salts.

6. Control of exotic species.

7. Restoration of riparian, wetland, and estuarine habitats.

8. Control of channel alteration.

Some of the factors listed above are beyond the immediate jurisdiction of the State Board. Nevertheless, the State Board has authority to direct or recommend that actions to address these factors be taken by other agencies which do have jurisdiction. See, e.g., Water Code sections 13146 (requiring state offices, departments, and boards to comply with state water quality policy in carrying out activities that affect water quality) and 13242 (authorizing the State Board to recommend appropriate actions by any entity, public or private, in order to achieve water quality objectives). CUWA therefore urges the State Board to address each of the factors discussed here as part of a coordinated estuarine protection program.

A. Unscreened water diversions in the Sacramento River and other locations.

The potential threat to resident and migratory fish populations of the large number of unscreened agricultural, municipal, and industrial diversions in the Sacramento River and the Delta has been recognized for over 20 years. Studies undertaken in the early and middle 1970s determined that large numbers of egg and larval striped bass and significant numbers of chinook salmon were entrained by agricultural diversions in the Sacramento

system. More recent studies, including an ongoing DWR study, confirm that entrainment of large numbers of fish continues.

The magnitude of the problem is large. There are over 300 unscreened municipal, agricultural, and industrial diversions on the Sacramento River between Redding and Sacramento that divert an estimated 1.2 million acre-feet of water annually. The number of unscreened agricultural diversions in the Delta is estimated at about 1,800. These facilities divert in excess of 2 million acre-feet of water annually, according to the National Marine Fisheries Service. During the active irrigation season, water is diverted from these unscreened diversions at a rate equal to the capacity of the Tracy Pumping Plant. Even large fish are vulnerable to entrainment at the diversions. (Data collected in a 1992 DWR pilot study indicate that substantial numbers of fish (including striped bass) are entrained in the diversions, while unpublished 1994 data indicate that substantial numbers of delta smelt similarly are entrained in the diversion siphons.)

California law currently requires screens on all new diversions. Additional control of adverse fishery effects for existing unscreened diversions would be carried out under the State Board's water rights authority to correct unreasonable methods of diversion.6/

The following is a summary of the recommended actions needed to address the problem of unscreened diversions:7/

- Collection of Basic Information (December 1995). The State Board would notify all diverters in and upstream of the Delta, riparian and appropriative, to report on their diversions. Upon receipt of letters of notification, diverters would have three months to report back to the Board. Public notice should be provided to inform those diverters that the State Board might not be aware of.

- Initial Evaluation (June 1996). In consultation with the DWR and the CDFG, the State Board would evaluate each diversion. Diversions would be categorized with respect to potential for damage to the fishery. For example, large diversions with high approach velocities operating in locations and at times when fish are present would receive a high priority for action. Small diversions, operating intermittently in locations where fish tend not to be found in large numbers, would receive a lower priority.

6/ The NMFS also has announced that it is considering a requirement for screens on Sacramento diversions. A six-month public comment period on this proposal closed in March 1994.

7/ Dates provided in the text are suggested dates of completion for described tasks.

- Development of Performance Criteria (June 1996). In consultation with state and federal agencies, the State Board would develop criteria for diversions. These criteria would pertain primarily to screening (e.g., type of screens, approach velocities, etc.).

- Development of Testing Specifications (June 1996). Diverters could obtain waivers from compliance with performance criteria by conducting tests to show that their diversions were not unreasonably affecting fish. These tests would have to be conducted in accordance with methods prescribed by the State Board. The specifications for these tests would be developed by the State Board in cooperation with DWR and CDFG, which have been carrying out such tests on actual diversions in the Delta.

- Development of Control Programs (June 1997). The State Board would notify diverters in the first priority category and inform them of the performance criteria for their diversions. The State Board would include reasonable schedules for compliance with the criteria. The State Board would request a simple program from each diverter for each diversion. This program would explain how the diverter would comply with the criteria and meet the schedule. The State Board would provide for appeals for exceptions under specified circumstances. For example, diverters would have the option of conducting tests in their diversion to show that screening is unnecessary.

- Installation of Controls (June 1999). First priority diverters would carry out the plan submitted to the State Board. When the controls had been installed, the diverter would notify the State Board. This notification would include agreement by the diverter to allow inspections by the State Board of the physical controls and methods of operation.

- Monitoring of Controls. The State Board would inspect each installation upon receipt of the notice of completion by the diverter. The State Board would check on operation of the controls from time to time.

- Repeating the Process for Lower Priority Diversions. The State Board would repeat this process for lower priority diversions. The process would stop when the State Board determined that controls on the next lower priority category of diversions are not cost-effective.

- Consolidation and Relocation of Diversions. The State Board should adopt policies (including incentives) that would encourage consolidation and relocation of diversions to the least environmentally sensitive locations.

B. Waste discharge control and pollution prevention.

Under current conditions, an estimated 5,000 to 40,000 metric tons of at least 65 pollutants enter the Bay-Delta each year. The fate of such materials is highly variable. Some are transported in the water column as dissolved or suspended materials and ultimately reach the ocean, and some settle out onto or into sediments. Some enter the aquatic biota food chain via ingestion or tissue uptake where they may bioaccumulate in certain tissues. Others are absorbed by riparian and wetlands vegetation and aquatic macrophytes.

It is widely recognized that such pollutants have impacted the aquatic ecosystem of the Bay-Delta, and in some cases, may have created conditions which are toxic to certain aquatic organisms. However, the degree to which specific pollutants have affected and are continuing to affect aquatic biota in the Bay-Delta is generally unknown due in part to the complexity of conditions that exist within the Bay-Delta and the historical absence of comprehensive monitoring programs.8/ This does not reduce the importance of this issue as a factor having a major influence on the Bay-Delta ecosystem. Rather, it reinforces the need for detailed, quantitative studies focused on identifying the major sources of pollutants, determining the overall effects of the hazardous substances, and developing and implementing measures which serve to eliminate or reduce those substances to concentrations having no adverse impacts on the aquatic ecosystem.

The control and regulation of the discharge of waste into and within California's waters is under the jurisdiction of the State Board and the regional water quality control boards under the Porter-Cologne Act and the CWA. The State Board's 1990 Pollutant Policy Document ("PPD") and the San Francisco Estuary Project's 1993 Comprehensive Conservation and Management Plan ("CCMP") have identified plans and definitive action strategies for the control of waste discharges and for pollution prevention. When implemented, these strategies should provide effective management of toxicity sources. CUWA therefore recommends that the following actions be taken:

8/ Recent monitoring programs have found evidence of toxic levels of pollutants, including pesticides, in the Bay-Delta. In its assessment of the impacts on water quality, sediment, and aquatic resources, the San Francisco Bay Regional Water Quality Control Board's regional monitoring program recently reported levels of polychlorinated biphenyls ("PCBs") that are five to almost twenty times EPA standards. Monitoring programs conducted by municipal waste and stormwater dischargers in both the San Francisco Bay Area and the Central Valley also have reported toxic levels of diazinon.

- PPD and CCMP. The State Board should conduct a workshop to review and assess the implementation of the PPD and update the document as appropriate. The State Board and the regional water quality control boards should also develop programs to implement the CCMP. The State Board should incorporate the PPD update and the CCMP action programs in its Coordinated Estuarine Protection Program.

- Regional Monitoring Program ("RMP"). This program was initiated in 1991 by the San Francisco Regional Water Quality Control Board as part of the Bay Protection and Toxic Clean-Up Program ("BPTCP"). It should be continued in the future consistent with the CCMP's regional monitoring strategy.

- Water Quality Control Plans. The statewide water quality control plans for inland surface waters and enclosed bays and estuaries, which included water quality objectives for a number of toxic pollutants, were recently declared invalid by the courts and no longer have any force or effect. The State Board should initiate proceedings to adopt a new bays and estuaries plan that contains definitive programs and time schedules for controlling major sources of pollutants to the Bay-Delta.

- Incentive Programs for Pollution Control. The State Board should assess options for developing incentive programs for industrial, municipal, and agricultural dischargers, focused on targeted reductions to agreed-to levels, with attainment tied to pollutant trading, mitigation banking, effluent fees, etc. The State Board should conduct a workshop on this issue within one year.

- Research and Studies. With the initiation of the RMP, data are being gathered on potential contaminants in the Bay-Delta in a manner which enables temporal and spatial comparisons of chemical composition, and an evaluation of potential toxicologic impacts. The State Board should support the action plan recommended by the CCMP.

- Non-Point Management (Agricultural and Mine Drainage). The State Board should conclude the review and update of the November 1988 Non-Point Source ("NPS") Management Program by July 1995 and amend it as necessary to achieve effective regulation of mine drainage, agriculture, and forestry land uses pursuant to section 6217 of the 1992 Coastal Zone Act Reauthorization Amendments.

- Pesticides. Pursuant to the December 1991 memorandum of understanding with the Department of Pesticide Regulation ("DPR"), the State Board should complete an implementation document to ensure that registered pesticides are used in a manner that protects water quality and beneficial uses. The State Board should direct the DPR to report on the status of its Pesticide Management Strategy, of the Rice Industry Pesticide Control Program, and other actions being taken to address pesticides (including diazinon) contributing to toxicity in discharges to Bay-Delta waters.

C. Legal fishing (sport fishing & commercial harvest).

A 1990 scientific paper reported that at least 106 major populations of salmon and steelhead on the West Coast had been extirpated and that 214 naturally existing stocks appeared to be facing a high or moderate risk of extinction. If anything, conditions have worsened since that time.9/ Moreover, the longer time goes on before effective remedial action is taken, the harder it will become to rebuild stocks because of the loss of wild fish genetically programmed to return to spawn in a given river. Hatchery salmon cannot take over that role.

The CDFG, the Fish and Game Commission ("FGC"), the Pacific Fisheries Management Council ("PFMC"), and NMFS have primary jurisdiction over this issue. The State Board should make the following recommendations for action by these agencies and request a report on implementation:

- Harvest Regulations. The CDFG, FGC, and PFMC should review and modify, if necessary, existing harvest regulations to ensure that they are adequately protecting aquatic species. The PFMC should consider initiating a program to conduct this task annually, and the FGC should do so bi-annually.

- Trawling Methods. Trawling methods currently used by the commercial shrimp industry result in the incidental take of striped bass and other fish species. Resource agencies should negotiate a memorandum of understanding to work with the commercial fishing industry to develop methods that would reduce the incidental take of non-target species.

9/ One consequence of worsening conditions has been the decision on April 8, 1994, by the Pacific Fishery Management Council to halt salmon fishing off the coast of Washington and to impose harsh limits on sport and commercial fishing off the coasts of Oregon and California.

In addition, the State Board should create incentives for water users' cooperative participation with upstream habitat restoration and improvement efforts currently underway by various groups, such as the Pacific Coast Federation of Fishermen's Association. Upstream habitat restoration is critical to stabilizing and reversing fishery declines.

D. Illegal fishing (poaching control).

In July 1992, the DWR and the CDFG developed a joint agreement to initiate a three-year program to increase enforcement efforts and deter illegal take of Delta resources, including the anadromous fishery and striped bass. Historically, about 500,000 undersized striped bass and an uncounted number of salmon are illegally taken on an annual basis. CDFG observations indicate violations of sport fishing regulations at a rate in excess of 65% throughout the Delta. If the joint program is successful in accomplishing its goal of decreasing violations by 20% throughout the Delta, approximately 150,000 to 200,000 undersized striped bass and thousands of spawning-sized fish will be saved. There needs to be a firm commitment to extend and expand this project.

CDFG has general authority to regulate fish and game resources and enforce the State Endangered Species Act. DWR also has responsibilities for protecting the beneficial uses of the Delta. Therefore, the State Board should:

- Recommend that CDFG and DWR increase interim funding for existing anti-poaching programs.

- Consider additional funding options for the special enforcement unit that has been established by CDFG to deter illegal takes and poaching.

- Recommend that CDFG (in cooperation with Friends of the San Francisco Estuary) report on the feasibility of developing and implementing an educational program to curb poaching of aquatic resources.

E. Land-derived salts (chemical pollutants and Delta water quality).

Urban water agencies have always given water quality a high priority, due in part to concerns over disinfection by-products and compliance with standards pursuant to the federal Safe Drinking Water Act ("SDWA"). New, more stringent SDWA standards, coupled with requirements to provide source water protection, will result in additional treatment costs and incentives to protect sources of drinking water from pollution of all types.

Recent concerns over disinfection by-products that are (in part) derived from salinity intrusion from seawater threaten to obscure serious water quality problems. These

problems are associated with constituents derived directly from human activities in the Sacramento and San Joaquin watersheds, such as drainage from mining in the north, agricultural drainage in the south and the Delta, and municipal and industrial discharges in both areas. A recent report by the Environmental Defense Fund ("EDF") documents the existence of land-derived salt problems and proposes the use of economic incentives to encourage cost-effective pollution control for agricultural discharges.

A particularly vexing problem is the potential use of high-quality water to dilute agricultural return flows originating from the Delta or the San Joaquin Valley. Using high-quality fresh water from the Sacramento side to dilute agricultural pollutants is a fundamentally inappropriate use of this precious resource. These pollutants, like any other, must be prevented from entering the state's waterways at the source, so that beneficial uses can be efficiently protected.

Although significant quantities of land-derived salts enter the Delta from specific point sources (e.g., drains), agricultural return flows generally are exempt from regulatory action under the CWA's National Pollutant Discharge Elimination System ("NPDES") permit program. The State Board's 1988 NPS Management Program does contain several options for controlling these discharges, however. CUWA therefore recommends the following actions by the State Board:

- Reaffirm the strategy included in the 1988 NPS Management Program for regulation of agricultural drainage during the current review and modification of requirements to implement the 1990 Coastal Zone Act amendments.

- Conduct a workshop on proposals (including EDF's recent proposal) to use economic incentives to control water pollution from agriculture and to achieve compliance with water quality standards.

F. Control of exotic species.

The fish assemblage currently inhabiting the Bay-Delta includes 55 fish species, of which 27 were either intentionally or accidentally introduced from other water bodies and have secured a sustainable niche within the ecosystem. The list of introduced invertebrate species numbers over 100 and includes several recent species which have shown rapid increases in population numbers. The most striking example of these is the Asian clam (potamocorbula amurensis), which was first observed in 1986 and now dominates most of the benthic communities in San Pablo and Suisun Bays.

The introduction of exotic or non-indigenous species ("NIS") have influenced the biological communities of the Bay-Delta system. However, the degree and extent to which such introductions will continue to impact the system remain unknown and largely unexplored. In its June 13, 1994, testimony to the State Board, the CDFG acknowledged that

"introductions (of species) have caused major changes in the fish fauna in the estuary, particularly in fresh waters." The CDFG concluded that "introductions since 1950 have caused substantial changes in aquatic invertebrates and established large populations of several species of smaller fish, but they have not coincided with the principal declines in other fish populations." Thus, while acknowledging that "introduced species" have influenced the aquatic biota, CDFG has downplayed their importance in potentially causing major declines in fish populations.

Regardless of the degree of impact, it is clear that introduced species do factor into the overall recovery of the system, and a program to provide fundamental information on their biological requirements and interrelationships with native fauna should be developed. Such a program would provide the necessary framework for developing "control" measures for certain species, including, where appropriate, eradication programs. In addition, more stringent regulations are warranted to control such introductions and prevent others from occurring.

The CDFG has the responsibility and authority for administering California law regarding the import, transfer, and introduction of non-native species into the state. Under the Lacey Act, the USFWS also has responsibilities for controlling illegal introductions of aquatic organisms. The State Board should request those agencies to undertake actions to address exotic species consistent with the CCMP.

G. Restoration of riparian, wetland, and estuarine habitats.

The Delta covers an area of 1,153 square miles or 738,000 acres. Historically, this area was a complex of low islands of tule marshes intersected by rivers, tributary channels, and dead-end sloughs, which were bordered by extensive stands of riparian forest growing on natural levees. The marshes and rivers were surrounded by seasonally flooded grasslands and oak savannah. The Central Delta was a vast tidal estuary, inundated by each tide.

This habitat has been extensively modified so that less than 100,000 acres of marsh, riparian, and upland habitats remain, and much of what remains is highly disturbed. This loss of habitat magnifies the importance of the remaining estuarine, freshwater marsh, and riparian habitats. Restoration of habitat throughout the Delta would reduce the vulnerability of many species by providing for broader distribution and variety of habitat. On the other hand, the State Board needs to recognize the conflict between the need for habitat restoration and the Delta Protection Commission's "Draft Delta Land Use and Resource Management Plan," which does not adequately recognize the fishery and aquatic habitat values of the Bay-Delta.

In addition to the State Board, there are several agencies with jurisdiction over this issue, including: CDFG, which has general authority to regulate fish and game resources and enforce the State Endangered Species Act; the U.S. Army Corps of Engineers, which has jurisdiction over discharges into waters of the United States under section 404 of the Clean

Water Act; the Federal Emergency Management Agency ("FEMA"), which establishes flood insurance requirements, including levee standards; USFWS and NMFS, which share responsibility for enforcement of the Federal Endangered Species Act; and the Delta Protection Commission, which is statutorily charged with developing a regional land use plan for the five Delta counties.

The State Board should encourage habitat restoration by explicitly recognizing that the environmental goals of water quality and water management regulations may in part be accomplished by measures such as habitat restoration. Numerous habitat restoration plans based on maintaining existing levees are outlined in the CDFG/DWR Draft "Sacramento-San Joaquin Delta Master Environmental Assessment," dated October 1993. Other plans based on removal of levees and complete restoration of marsh, riparian, and upland habitats will need to be developed.

Finally, the State Board needs to identify and convey to the Delta Protection Commission potential conflicts between the land use plan and policies developed by the Commission and the opportunity to further enhance the aquatic habitat value of Delta islands. Because the Commission will function as an appellate body in challenges to individual county plans, it is critical that the Commission's work recognize the changes that may occur in the Delta as the state's water supply and quality concerns are addressed.

H. Control of channel alteration.

Aquatic habitats, including bed and bank in the lower Sacramento and San Joaquin Rivers and the Delta, have been extensively altered from their natural states for a variety of purposes, including navigation, flood control, conversion into agricultural land, water quality, port, and industrial and urban development. This has resulted in degradation of habitat used by aquatic biological resources. In many cases, these alterations, especially navigational channels, dikes, and other revetments, require extensive, ongoing maintenance which further interferes with habitat. In addition, the deepening of the ship channel to Martinez has the potential to increase saltwater intrusion into the most vulnerable portion of the estuary.

The net result of these activities has been to greatly reduce the quantity of aquatic and estuarine habitats available to aquatic species and, in many cases, to reduce the quality of remaining habitats. Specifically, many miles of stream banks and marsh boundaries have been riprapped, productive shallows and shoals have been reduced or eliminated on a vast scale, channels have been greatly shortened, and large areas formerly occupied by meandering river and tributary channels have been cut off and converted to agricultural and other terrestrial uses.

The heightened concern over apparent population declines during the recent drought may well be a result of this increased vulnerability. Continued encroachments and failure to remediate former habitat areas lost to physical changes in the lower river systems, the Delta, and the estuary can only exacerbate the present situation.

To address this problem, CUWA recommends the following actions:

- The State Board, in cooperation with the Delta Protection Commission, should establish administrative mitigation requirements which address the need to reclaim aquatic areas into more productive status with maintenance dredging, levee and revetment maintenance projects, new riparian fill projects, and related activities requiring state permits.

- Through CWA water quality certifications, the State Board and regional water quality control boards should require an analysis of all project impacts on estuarine habitat.

BAY-DELTA ESTUARINE PROTECTION PROGRAM

PART TWO - IMPLEMENTATION

I. PHASED APPROACH TO IMPLEMENTATION

An important objective of CUWA's proposed Coordinated Estuarine Protection Program is achievement of full compliance with all elements of the program in the shortest reasonable time. This is essential in order to provide adequate protection for the environmental and public trust values associated with the estuary without jeopardizing other beneficial uses of Delta waters, which are critical to the state's overall water supply and economy.

A. Guiding principles.

CUWA's recommendations regarding implementation of its proposed Coordinated Estuarine Protection Program reflect the following important principles:

- **The Need for Shared Responsibility**

  CUWA believes that all users of water from the watershed share a measure of responsibility for the biological decline of the Bay-Delta and therefore must share responsibility for mitigating the impacts of their respective uses. The quantification of impacts by all diversions will be complex and time-consuming, however. The State Board should not wait until there is scientific quantification of each water user's effect on the system.

- **The Need for Coordination Among Different Control Strategies**

  As allocation of responsibility to different users and implementation of multi-species ecosystem protection requirements are phased in, responsibility for Bay-Delta protection should be balanced between the projects, non-project users, and the control of other bio-degradation factors. Unless these other factors are successfully addressed, there is no certainty that the estuary will recover.

- **The Need to Facilitate Water Transfers**

  Water transfers may be necessary to offset reductions in available water supplies that result from the implementation of the estuarine habitat standard and management requirements for

multi-species protection. The development of such requirements should therefore be undertaken with a recognition of the need to facilitate transfers through, e.g., allowing modification of flow requirements as necessary to allow the cross-Delta transfer of water pursuant to existing or future water marketing agreements.

B. Overview.

The State Board should adopt a phased approach that reasonably and rationally allocates the burden of implementation among all responsible parties. This approach would require the State Board to initiate multiple implementation strategies in a coordinated fashion. Some of these strategies could be undertaken pursuant to the State Board's authority under the Porter-Cologne Act. Other elements would require an exercise of the State Board's water rights authority under Division 2 of the Water Code. Still others would require the State Board to work closely with other state and federal agencies, consistent with commitments reflected in the Framework Agreement.

Specifically, the proposed approach would involve the State Board in the following actions:

(i) Prompt adoption of a revised water quality control plan for the Bay-Delta under the Porter-Cologne Act. The revised plan would include CUWA's proposed estuarine habitat standard, as well as an identification of management requirements for multi-species protection: The revised plan would be submitted to EPA in lieu of EPA's currently proposed water quality standards under section 303 of the Clean Water Act.

(ii) As contemplated by the Framework Agreement, negotiation of a voluntary interim agreement with the SWP, CVP, and potentially other users to undertake operational and flow-related measures identified in the revised water quality control plan.

(iii) As early as practicable, issuance of an interim water rights decision pursuant to the State Board's authority under the Water Code, in order to establish a preliminary allocation of responsibility for compliance with estuarine habitat standards and management requirements. The interim decision would include provisions for a mitigation fund and mitigation credits to accommodate equitable adjustments to allocation determinations.

(iv) Initiation of actions identified in the revised water quality control plan to address additional bio-degradation factors. Those actions could include additional State Board workshops to develop

information and proposals for action within the State Board's jurisdiction, as well as specific recommendations for further action by other agencies (including regional water quality control boards) where appropriate.

(v) Implementation of a comprehensive monitoring program, consistent with proposals contained in the CCMP, to evaluate the effectiveness of compliance actions in protecting and restoring the environmental health of the Bay-Delta. This should also include real-time monitoring and response actions to improve effectiveness of control measures.

(vi) Initiation of a full water rights proceeding to supplant the preliminary allocations of responsibility made in the State Board's interim water rights decision.

(vii) Pursuant to the triennial review requirements of the Clean Water Act and other provisions of law, revision of adopted standards and operational requirements as necessary to reflect new information obtained through the comprehensive monitoring program and progress in implementing measures to address bio-degradation factors.

Individual aspects of CUWA's proposed phased implementation approach are discussed in the following sections.

C. Project responsibility.

Direct and indirect impacts of project export operations, combined with the recent drought, may have contributed significantly to fishery declines in the Bay-Delta. Through compliance with State Water Rights Decision 1485 and operational requirements imposed under the ESA, the SWP and CVP already are taking actions to mitigate these impacts. In order to comply with proposed estuarine habitat standards, however, it may be appropriate for the projects to consider voluntarily agreeing to the implementation of certain requirements at an early date.

As a matter of law, it may not be possible to require the SWP and the CVP to operate under more rigorous outflow and operational requirements until the State Board has followed the formal administrative process and made the public interest and other determinations required by Part 2 of Division 2 of the Water Code. Such actions may also require compliance with the environmental review requirements of the California Environmental Quality Act ("CEQA"). Delayed implementation of additional project operational measures until after completion of a full water rights proceeding, however, could defer attainment of environmental standards and result in further requirements under the ESA.

The State Board should therefore attempt to negotiate an interim agreement with the SWP and the CVP to comply with specific operational and flow-related requirements in a revised Bay-Delta water quality control plan. As discussed above, these measures should include requirements for Delta outflow and pulse flows, for cross-channel gate closure and the construction of new physical and/or acoustic barriers, and for the coordinated reduction of exports in times of fish migration and spawning. Entering into such an agreement would be consistent with commitments made by the parties to the Framework Agreement, which directed the DWR and the U.S. Department of the Interior to make a "reasonable contribution" toward the attainment of standards in operating the projects, pending the conclusion of necessary water rights proceedings.

To ensure a "reasonable contribution" by the projects, the State Board should seek to achieve an agreement that meets certain conditions:

(1) The agreement should only be entered into after seeking the consent of the projects' customers, and it must not impose unreasonable impacts on the provision of reliable water supplies to areas served by the projects.

(2) The contribution required by the projects should be set at a level estimated to mitigate initial impacts to the projects.

(3) It should be made clear that the projects' contribution is an interim measure that will not prejudice the outcome of a full water rights decision, which may result in a substantially different conclusion regarding the level of SWP and CVP contributions that are appropriate.

Finally, the State Board should seek to ensure that the water set aside by the Central Valley Project Improvement Act ("CVPIA") is used to meet appropriate contribution requirements.10/

D. Non-project water users.

The decline of the Bay-Delta ecosystem is the result of many activities. Some of the problems facing the estuary are attributable to the SWP and the CVP, while others result from the operations of non-project water users, and still others are caused by a combination of project and non-project water uses. Therefore, subject to legal, scientific, and public policy considerations, the State Board should involve all parties whose activities impact the beneficial uses of the estuary in addressing these problems.

10/ The CVPIA allocated up to 800 total acre feet ("TAF") per year of CVP yield for protection of public trust uses in the Bay-Delta and its watershed (reduced to between 600 TAF and 800 TAF in years when CVP customers are required to take deficiencies in water deliveries).

Initially, the State Board should consider all water users, both large and small, whose activities impact protected uses. This community of water users includes both those within and those upstream of the Delta. The State Board must consider not only actions involving the diversion of water, but also actions associated with the various bio-degradation factors described earlier, including, without limitation, contribution of pollutants, entrainment of fisheries, alteration of the timing of flows, and other actions.

In conjunction with allocating responsibility to the CVP and SWP on an interim basis, the State Board may consider seeking voluntary agreement from non-project water users to assume a level of responsibility during the interim period. However, ultimate responsibility must not be allocated to either the project or non-project users until full consideration of each party's responsibility has been made through the three-tiered allocation method recommended by CUWA and others. See Section (E), below.

E. Allocation of responsibility.

Pending a final decision in the water rights phase, CUWA recommends that the State Board seek to allocate interim responsibility for meeting Delta requirements to the state and federal projects, and perhaps others. However, the State Board must not allocate final responsibility for meeting Bay-Delta requirements until at least the completion of the water rights phase. Furthermore, this "final" allocation of responsibility may have to be altered as additional information is acquired concerning the actual impacts of activities by various water users.

Regardless of agreements or assignments of responsibility during the interim phase, the State Board must complete a full analysis of the parties' responsibilities during the water rights phase to arrive at an appropriate allocation of responsibility for meeting standards. It is essential that the State Board take no action which will preempt a full consideration of all factors relevant to a final determination of responsibility.

CUWA therefore recommends that the State Board adopt the following approach:

First, in addressing outflow requirements, for example, a rough estimate of each user's share of cumulative impacts of diversion and use of water would be determined based on that user's proportionate share of the total depletions from the unimpaired flow to and through the Delta. (Other methods to determine this "base impact" also may be reasonable.)

Second, the base impact of each user would be specifically reviewed to determine whether it is reasonable and in the public interest. A range of factors would be considered that could increase or decrease the user's responsibility. Ideally, some objective criteria could be developed to rate these factors. However, because of the wide variety of water users and variables that affect the reasonableness of use, some policy judgment would be required. The factors that could be considered in this context include, without limitation:

- The water user's seniority.

- The water user's priority.

- Whether the user practices appropriate water management such as conservation, reclamation, drought management planning, and good groundwater management.

- Other specific impacts associated with the user's diversion or use, such as entrainment, reverse flows, effect on timing and temperature, and polluted return flows.

- The population or economic activity supported by the use.

Third, after a water user's responsibility has been so determined, it may still be unreasonable (due to special circumstances) to require that user to meet its responsibility exclusively by surrendering a portion of its water supply. Therefore, a program would be developed to allow a user to establish "mitigation credits," as appropriate, to be used in lieu of directly meeting its obligations as determined by the State Board.

F. Water impact caps.

The State Board should establish a water supply impact threshold (cap) beyond which compliance with Bay-Delta standards would be achieved with purchased water paid for by a fund established for this purpose and supported by payments from Bay-Delta watershed users and other sources.11/

A supply impact cap would ensure that the environmental objectives of standards are achieved while reducing the uncertainty of water supply reliability and preventing severe economic impacts caused by water shortages. In addition, an impact cap would, in the long run, protect winter-run chinook salmon by increasing the probability that reservoir capacity would exist in drought periods to provide flows necessary to meet temperature requirements for this endangered fish.

CUWA proposed a water supply impact cap in its comments on D-1630. Under the proposal, a designated entity would acquire any additional water necessary to meet the environmental objectives of D-1630 through a mitigation fund, discussed below. The fund would acquire the necessary water by two means: (1) purchasing water from willing sellers in both the Sacramento and the San Joaquin watersheds, when water is needed above the

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11/ The intent of the fund would be to ensure that standards are fully met through mandated water releases as well as water purchases.

designated cap to meet flow and water quality requirements; and (2) paying export users to reduce their deliveries to meet export constraints required by D-1630.

Using voluntary purchases to obtain supplies to meet Bay-Delta standards has several advantages. First, it enables water users to avoid excessive reductions that would bring unreasonable costs to their customer base. Second, market forces would determine the source of supplies above the cap, reducing the negative impacts of forced reductions ("takings"). Relying on market forces to obtain additional supplies would lower overall costs and impacts on the state's economy. Permitting market forces to determine contribution to additional outflow through the Delta would lessen the impacts on agricultural areas and on California's overall economy, because the water contributing least to the state's economic production would be the first sold for environmental restoration.

Using a purchasing fund also would reduce third-party or community impacts arising from supply reductions. Unlike regulatory takings of water supplies, voluntary purchases leave the seller with monetary compensation for the reduction in water use. The seller may then reinvest those revenues in other agricultural enterprises or in capital outlays (including water conservation measures).

G. Mitigation credits.

The concept of mitigation credits as a component of the solution for Bay-Delta water quality problems has been discussed in some form since the issuance of D-1630. Most recently, CUWA endorsed a program of mitigation credits which expanded the use of credits beyond the proposal in D-1630. The purpose for the expansion of this program is to avoid a situation where a small number of users would dominate the mitigation credit market due to their financial or institutional ability to negotiate contracts with agencies that have water in excess of their needs or to develop their environmentally beneficial projects which small or less wealthy agencies would not be able to develop on their own.

The utility of the mitigation credits concept is several. First, as water releases (or other protective measures) for environmental purposes are lawfully allocated to a large community of water users, there will be entities from which it may be unreasonable to require flow releases (or other mandated actions); thus, the mitigation credits concept would allow initially for the substitution of money or, in the long term, other actions. Second, recognizing that a "negotiated" solution to the Bay-Delta problems, perhaps in conjunction with state or federally created mandates, is likely to be attempted, parties may be more willing to participate in the solution if the system is sufficiently flexible to accommodate their needs under varying conditions. Third, mitigation credits will provide revenue to sellers of water and other environmental benefits (e.g., land for wetlands), which in turn will allow the sellers to make capital improvements and meet other needs.

Key to the implementation of any mitigation credit program will be the water rights adjudication to be conducted by the State Board, which will determine the parties' respective obligations to provide Delta protection. As has been discussed in many of the

comments which the State Board has received, there are alternative ways and degrees in which responsibility may be allocated.

CUWA believes that acceptable forms of mitigation credits would change over time. In the immediate future (following adoption of new water quality standards), mitigation credits would likely be allowed only for payments for water and diversions.12/ Over time, the State Board or other appropriate agencies would identify other measures determined to provide an equal benefit for the otherwise mandated action or forbearance, and mitigation credits could be allowed for carrying out such activities. CUWA believes that most activities that would be appropriate for such credits will be identified in a Comprehensive Ecosystem Management Plan. For example, if a party is required to release a certain amount of water but elects to pay money instead, that party would remain liable for the release until the water actually is produced from another source.

1. Mitigation credits program.

The mitigation credits program will allow a water user to meet some or all of its environmental obligations under prescribed conditions by substituting another resource deemed equivalent to its required action. Some obvious alternatives would include money paid to a fund to be used for the purchase of water and the direct purchase of in-lieu water from an alternative source. Other alternatives may be dependent on the development of a comprehensive plan and monitoring program. These could include, without limitation, authorizations to divert water in exchange for the purchase of an equivalent forbearance or the creation of an environmentally beneficial project that is deemed to be an acceptable substitute for the obligation.

The program would be administered by a state agency, such as the State Board, or perhaps one formed specifically to deal with environmental water issues/allocations. Mitigation measures would be identified by the State Board, water suppliers, fishery agencies, and others. The value of the measures in relation to the mandated action would be established by the State Board or other agency, following appropriate public hearings. To the extent possible, the State Board should establish the parameters for the use of mitigation credits in the implementation phase of the Bay-Delta hearings.

As the knowledge of the Delta's requirements increases, the mitigation credits program should expand to allow more variety in the types of activities which will qualify. The development of a comprehensive program for addressing the various needs of the Delta will further the program. In order to identify candidate projects which do not involve the exchange of identical actions (e.g., water for water, pollutant for pollutant), a sophisticated monitoring program is essential.

12/ In addition, the State Board should consider application of credits to such factors as source control for salinity discharge reductions.